

Electrical Components for Versatile Military Applications

NETKE S A¹, JADHAV D M², SIRSAT S A³, MATE A K⁴

¹ Lecturer, Department of Electrical, M S polytechnic college Beed, Maharashtra, India

²HOD, Department of Electrical, Aditya polytechnic college Beed, Maharashtra, India

³ Lecturer, Department of Electrical, M S polytechnic college Beed, Maharashtra, India

⁴ Lecturer, Department of Mechanical, Aditya polytechnic college Beed, Maharashtra, India

ABSTRACT

Now a days Modern Military applications use latest detection and surveillance technologies to provide a real time situational battlefield awareness to identify threats. Those detection systems are depend on a reliable power source and the capability to flexibly move electrical power from one system to another.

Our Military graded Generator Control Units, Scavenger (dust) blowers and ventilators as well as Voltage controllers provide the support that is required to accomplish your mission.

The electrical components of the Defense & Civil Systems division are mainly designed for 28V power supply. Due to their high performance and ruggedness, these components fit perfectly with operations in military land vehicles

Keyword: - voltage, current.

1 HYBRID AUXILIARY POWER UNIT

The Jenoptik division site Lechmotoren has developed a brand new Hybrid Power Unit for the surface-to-air missile system PATRIOT. The hybrid power supply features a powerful generator set, super caps, an integrated power interface and a control panel.

2 GENERATOR SET

The Generator Set (GS) is a portable, all-weather, Diesel-generator unit capable of supply 15 kW AC power. This unit is a self-contained, skid-mounted, and modularized 15 kW GS adaptable to ground-level, truck, or trailer bed emplacement etc. The GS is powered by a 3-cylinder, air-cooled diesel engine for increased reliability. The GS can provides 24 VDC power for internal control and monitoring circuits. The unit includes all electrical and mechanical interfaces to the Patriot system.

In this sysem the trailer mounted configuration it can be used as the prime power source 120/ 208 Vac 400 Hz for the Battalion maintenance group (BMG) and Battalion Maintenance Equipment (BME)

3 POWER SUPPLY

The designer shall provide each new, refurbished or leased facility with a suitable power supply in accordance with the requirements as per MIEE.

The designer must review the existing reticulation system and the feeders to the establishment to confirm there is adequate capacity and this must include assessing the impact to the current energy contracts and network

agreements. The Director of Energy Services and the Regional Manager can provide advice on existing retail contracts or network agreements respectively.

Where there is requirement augmentation is only simple in nature such as the addition of a single substation and the existing reticulation system has adequate capacity, the design report is to reflect outcome of these investigations and detail the proposed works for agreement. Alternatively where considerable high voltage system augmentations are required such as a number of substations, more than 100 metres of high voltage cable or the ring does not have capacity, a project High Voltage Development Plan in accordance with the MIEE must be prepared to assist the defense consideration.

It is important to identify the required reticulation system augmentations as early as possible so that the Director of Estate Engineering Policy (DEEP) can agree to the propose augmentation and also advise the need for a High Voltage Development Plan. Refer to the MIEE for the Development Plan requirements or liaise with DEEP for any clarification.

All the electrical reticulation the system modifications must be formally agreed by DEEP through the design report process.

4 DISTRIBUTION NETWORK SERVICE PROVIDER (DNSP)

The designer when considering if reticulation the system augmentation works are required, needs to consider who owns the reticulation, Defense, DNSP or other agency. The designer must be not make any undertaking with the NSP or third party without primary formal Defence agreement. It is important that all such works be agreed by Defence prior to any formal agreement with these agencies.

5 HIGH VOLTAGE SYSTEM DOCUMENTATION

The designer shall be prepare revised High Voltage System Documentation whenever an alteration is preformed to the reticulation system in accordance with the MIEE. This documentation must be handed over to the electrical operating authority prior to completing any construction work to ensure safety.

6 EMERGENCY POWER

Emergency power installations shall only proceed if their respective sponsors having successfully argued for their justification. Guidance on the justification process and the associated risk assessment and analysis is included in the MIEE.

7 AIRCRAFT EARTH REFERENCE POINT

The Aircraft earth reference points shall comply with the requirements of Australian Air Publications (AAP) 7045.002-01 Chapter 14. Where associated with a facility or in future facility they shall be equipotentially bonded in accordance with AS/NZS 3000, AS1020 and AS1768. Note the FDB will needs to specify the required location of the aircraft earth reference points.

Include in the FDB

- a. The required location for the earth reference points.

8 CENTRAL EMERGENCY POWER STATIONS (CEPS), CENTRAL POWER STATION (CPS), CENTRAL ENERGY PLANT (CEP)

CEPS/CPS/CEP installations or upgrades will require a separate FDB brief developed on a case by case basis to suit the specific installation requirements. Normally a suitable scoping study will be required to form the basis of the requirement. When required, seek in depth guidance for developing the FDB for CEPS/CPS/CEP. Aspects that will need to be addressed include:

- a. Determination of required capacity, configuration, location and connection arrangement or the need to investigate and determine these;
- b. Post disaster and passive defence functionality requirements;
- c. Fuel types, use emergency fuels, such as Avtur. As a general requirement the designer must undertake suitable analysis/cost benefit study of all fuel types available and make recommendations to Defence on the most appropriate fuel for the power station.

9 CONCLUSION

The defence industry provides support for national security and protection for sovereign governments, their citizens and their armed troops. Engineering capacity underpins the success of the defence sector and spans a full range of products and services to support land, air and naval forces. Equally important are modern electronics and systems engineering, which provide technological innovations to support all areas of defence capability.

Defence engineering brings opportunities to work on some of the most technologically advanced projects in the today's world. The Opportunities exist in both the public sector, in particular within the armed forces, and the private sector, which includes a range of defence organisations. In many countries there is a shortage of the graduates with suitable technology and engineering skills.

10. REFERENCES

- [1]. Wikipedia
- [2]. Ronalds, B.F. (2016). Sir Francis Ronalds: Father of the Electric Telegraph. London: Imperial College Press. ISBN 978-1-78326-917-4
- [3]. "History - School of Electrical and Computer Engineering - Cornell Engineering"
- [4]. Grattan-Guinness, I. (1 January 2003). "Companion Encyclopedia of the History and Philosophy of the Mathematical Sciences". JHU Press – via Google Books.